

## DSDP Leg 55—The Cold War and a Test of the Hawaiian Hot Spot Hypothesis

BY H. GARY GREENE

Having just retired from teaching at Moss Landing Marine Laboratories, I have been reflecting upon my life, both in teaching and as a researcher at the U.S. Geological Survey (USGS), and without a doubt my experiences with ocean drilling were the highlights of my career. A cruise that was especially remarkable was Deep Sea Drilling Project Leg 55. Participation in this leg produced an excitement and love for geology that is hard to describe. It fueled the fires of desire to search for facts and solve the puzzle of the Earth—inspiration that remains with me today and continues to carry me on in my research.

In 1977, as a young geologist with the USGS, I was fortunate to participate as the Underway Geophysicist on Leg 55 to test the Hawaiian Hot Spot hypothesis. This was an exciting cruise undertaken during the peak of the Cold War, but plagued with drill stem problems. The leg started from Hawaii just after Howard Hughes' company had recovered a soviet submarine from the seafloor. Consequently, when we departed Honolulu, there was a Russian submarine waiting to tail us to the Emperor Seamounts. The submarine stayed on the surface, down current of us, and every time we dumped garbage (we did those sort of things in those days) they picked it up and searched through it all, even though we had a Russian Petrologist, Dr. Gennady Avdeiko, on board. One day we broke our last bumper sub and had to abandon the drill site and head for Adak, Alaska to pick up new ones. We slipped a note in an empty bottle and sealed it well, included it in the garbage we dumped that day and watched as the submariners scooped the bottle from the water. The note read "Surprise! You are going to Adak, Alaska." And sure enough they followed us.

When we departed Adak for the Emperors again, there was a Russian surveillance ship waiting to tail us, which stayed with us all the way through the cruise and into Yokohama, Japan. During this time we were also visited by a sea lion (not sure if it was from Russia or not), which fed at night on squid that were attracted by the lights of the *Glomar Challenger*. Once, dumping garbage, the drillers felt sorry for the sea lion not being able to rest so they rigged a platform that they lowered at night and raised during the day with the sea lion aboard. This animal became the mascot of the leg.

Even with the problems and surveillance we encountered, the cruise went well and we were able to drill through and geographically locate, using paleomagnetism, over 100 lava flows on Suiko Seamount. These flows suggested that the central Emperors originated at about 18°N, the latitude of the island of Hawaii, however, a recent Ocean Drilling Program cruise that drilled the Emperors suggest that the hot spot wandered more than previously thought.

Other participating scientists included Dale Jackson and Itaru Kozumi (Co-Chiefs), Ari Butt, David Clague, Brent Dalrymple, Anne Marie Karpoff, Jim Kirkpatrick, Masaru Kono, HsinYi Ling, Judy McKenzie, Jason Morgan, and Toshiaki Takayama.

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Soviet surveillance ship taking pictures of the drilling operations of *Glomar Challenger* on Suiko Seamount during one of many passes the ship made.

Sea lion on platform that the drillers rigged to allow the animal to rest during the day. The platform was lowered at night so that the sea lion could feed on the many squid that were attracted by the *Glomar Challenger's* lights.

